



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,957	04/12/2004	Takayuki Suzuki	Q80989	2365
23373 7590 06/09/2009 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
EXAMINER				
LANGMAN, JONATHAN C				
ART UNIT		PAPER NUMBER		
1794				
MAIL DATE		DELIVERY MODE		
06/09/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/821,957

**Applicant(s)**

SUZUKI, TAKAYUKI

**Examiner**

JONATHAN C. LANGMAN

**Art Unit**

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) 3-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by and/or rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al. (6,252,261).

The instant specification teaches a substrate, a buffer layer, comprising GaN or AlN, a first nitride semiconductor layer, 2, a mask comprising, Silica, silicon nitride, and a refractory metal, followed by an epitaxial layer overgrowth of a nitride semiconductor layer, 4, thereon. The top layer, 4, is grown to a sufficient thickness (200 microns or more) in order to obtain a free standing bulk nitride semiconductor film once the underlying substrate, buffer layer, nitride layer, 2, and mask are removed.

Usui et al. teach a method of making a free standing nitride semiconductor layer. The process includes a substrate of sapphire (col. 6, lines 16), growing a low temperature buffer layer of GaN with a thickness of 10-50 nms thereon (col. 6, lines 64-

68), growing a first base nitride semiconductor layer comprising GaN with a thickness up to 20 microns thereon (col. 6, lines 30-35), and a patterned mask comprising silica, silicon nitride (col. 7, lines 64-67), or tungsten, (col. 23, line 8) a refractory metal, with a thickness of 0.01 microns to 5 microns thereon (col. 7, lines 64-67).

The mask blocks dislocations from propagating into the upper nitride layer, and is patterned as desired to control the amount of dislocations blocked from propagating into the upper nitride semiconductor layer (col. 8, lines 1-15). Usui goes on to teach a top nitride semiconductor layer thereon, which comprises an epitaxial layer overgrowth technique where the mask restricts dislocations and allows for a higher crystallinity top nitride semiconductor layer to be grown (col. 8, lines 31-59). This technique is substantially identical to that taught in Examples 6 and 7 of the instant invention.

The thickness of the top nitride semiconductor layer is greater than 200 microns (col. 10, lines 5-10), and the diameter is 25.4 mm (col. 25, lines 24). Usui goes on to teach removing the underlying layers in order to obtain a free standing nitride semiconductor layer (col. 23, lines 54-58).

Usui teaches that this growth technique results in a high crystallinity nitride semiconductor layer (col. 29, lines 28-31), however, never characterizes the crystallinity by taking a FWHM at a (20-24) plane. However it is the Examiners position that since Usui teaches a growth technique substantially identical to that instantly taught, then it is inherent that the instantly claimed characteristics such as FWHM would be present in the nitride semiconductor layer as taught by Usui.

It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada*, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). The ***prima facie*** case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Since Usui teaches the same structure and the same growth technique as instantly taught, it is the Examiners position that the nitride semiconductor film of Usui will inherently possess the instantly claimed FWHM of less than 50 seconds in a 20-24 plane.

Regarding claim 2, Usui teaches an undoped film with a carrier density of less than  $10^{20} \text{ cm}^{-3}$  (col. 29, lines 55-67).

Regarding claim 8, the layer is used to epitaxially grow a semiconductor film thereon to produce a light emitting device structure (col. 30, lines 1-28).

### ***Response to Arguments***

Applicant's arguments, filed February 26, 2009, with respect to Melnik and Albrecht have been fully considered and are persuasive. The rejections of Claims 1, 2, and 8 with respect to these references have been withdrawn. None of the prior art

references teach the instantly taught growth method, nor do they teach the instantly claimed FWHM.

Applicant's arguments with respect to claims 1, 2, and 8 have been considered but are moot in view of the new ground(s) of rejection of Usui et al.

The applicants narrowed the breadth of the claims, and therefore necessitated a new search and consideration of the art.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN C. LANGMAN whose telephone number is

(571)272-4811. The examiner can normally be reached on Mon-Thurs 8:00 am - 6:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCL

/Timothy M. Speer/  
Primary Examiner, Art Unit 1794